



# RAILROAD COMMISSION OF TEXAS

## SURFACE MINING AND RECLAMATION DIVISION

February 13, 2014

**Sent by Email and First-Class Mail**

Mr. Tommy Hodges  
Energy Manager  
Alcoa, Inc. (Alcoa)  
P. O. Box 1491  
Rockdale, Texas 76567-1491

RE: Sadow Mine, Permit No. 1F  
Revision No. 40 - Bond Map Revision

Dear Mr. Hodges:

Review of Revision No. 40, submitted by letter dated September 11, 2013, has been completed. The application includes revised bond maps and a reclamation cost estimate. Supplemental information was submitted by letter dated January 8, 2014, in response to Staff comments dated November 6, 2013, which replaced the initial submittal in its entirety. The \$500 revision application-filing fee was included in the initial submittal. The application is considered complete and is accepted for filing.

The bond maps in Revision No. 40 reflect correction of minor mapping errors, removal of undisturbed areas from bonded areas and accounts for recent approvals for release of reclamation liability. The revised bonded areas are shown on Dwg. Nos. 145-B1, *North Area Proposed Bond Map*, and 145-B2, *South Area Proposed Bond Map*, dated revised January 3, 2014).

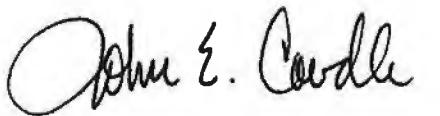
Staff has updated its reclamation cost estimate for the Sadow Mine to take into account the proposed bond map changes and unit costs from the attached Staff Reclamation Cost Analysis. Staff's estimate shows that the revised cost of reclamation is \$27,091,226, which is higher than Alcoa's estimate of \$26,256,023. The application was reviewed as a revision to Permit No. 1F. I find that Revision No. 40 does not constitute a significant departure from the approved reclamation plan in accordance with §12.226. Alcoa's \$56,000,000 self-bond approved by Order dated February 7, 2012, is sufficient to cover the cost of reclamation. Staff's reclamation cost estimate is adopted as the minimum required reclamation bond amount. The revised bond maps, Drawing. Nos. 145-B1, *North Area Proposed Bond Map*, and 145-B2, *South Area Proposed Bond Map*, revised dated January 3, 2014, are approved and your permit is revised accordingly.

A replacement self-bond in the amount of \$28,000,000, submitted by letter dated November 15, 2013, has been filed with the Hearings Division (Docket No. C14-0010-SC-01-E) for presentation to the Commission. The proposed \$28,000,000 replacement self-bond currently under review will be sufficient to cover the cost of reclamation.

Mr. Tommy Hodges  
January 13, 2014  
Page 2

A copy of the Staff review memorandum documenting our review is attached. If you have any questions, please do not hesitate to call.

Sincerely,



John E. Caudle, Director  
Surface Mining and Reclamation Division

JEC/IA  
Attachments  
File Ref. No. 1325502



# RAILROAD COMMISSION OF TEXAS

## SURFACE MINING AND RECLAMATION DIVISION

### M E M O R A N D U M

TO: John E. Caudle, Director *[Signature]*

THRU: Travis L. Wootton, Manager, Applications and Permits  
Jackey L. Rodgers, P.E., Advising Mining Engineer

FROM: Israr Anwar, P.E., Engineer

SUBJECT: Alcoa Inc. (Alcoa)  
Sandow Mine, Permit No. 1F  
Revision No. 40 - Bond Map Revision

DATE: February 13, 2014

Alcoa submitted Revision No. 40 by letter dated September 11, 2013, requesting approval of revised bond maps and a revised reclamation cost estimate. Supplemental information was submitted by letter dated January 8, 2014, in response to Staff comments dated November 6, 2013. The supplement replaced the initial submittal in its entirety. The \$500 revision application-filing fee was included in the initial submittal. Below is a summary of the application and my technical review:

#### PROPOSAL SUMMARY

1. The proposed bond maps (January 8<sup>th</sup> submittal) reflect minor mapping error corrections (2.5 acres), the removal of undisturbed areas from the bond (571.2 acres), and are updated to account for recently approved releases of reclamation liability. The proposed changes are delineated on the bond change maps: Dwg. Nos. 145-B5, *North Area Proposed Bond Map Changes*, and 145-B6, *South Area Proposed Bond Map Changes*, dated revised January 3, 2014. The proposed bonded areas are shown on the revised bond maps: Dwg. Nos. 145-B1, *North Area Proposed Bond Map*, and 145-B2, *South Area Proposed Bond Map*, dated revised January 3, 2014. The January 8<sup>th</sup> supplement also contains the following maps which show a breakdown of the proposed changes and proposed bond areas:

Map	Title	Map Date
145-B1	<i>North Area Proposed Bond Map Changes Mined to Undisturbed</i>	November 8, 2013
145-B2	<i>South Area Proposed Bond Map Changes Mined to Undisturbed</i>	November 8, 2013
145-B1	<i>North Area Proposed Bond Map Changes Disturbed to Undisturbed</i>	November 8, 2013
145-B2	<i>South Area Proposed Bond Map Changes disturbed to Undisturbed</i>	November 8, 2013
145-B1	<i>North Area Proposed Bond Map Changes Undisturbed to Mined</i>	November 8, 2013

Map	Title	Map Date
145-B2	<i>South Area Proposed Bond Map Changes Undisturbed to Mined</i>	November 8, 2013
145-B1	<i>North Area Proposed Bond Map Changes Undisturbed to Disturbed</i>	November 8, 2013
145-B2	<i>South Area Proposed Bond Map Changes Undisturbed to Disturbed</i>	November 8, 2013
145-B1	<i>North Area Proposed Bond Map Changes Mined to Disturbed</i>	November 8, 2013
145-B2	<i>South Area Proposed Bond Map Changes Mined to Disturbed</i>	November 8, 2013
145-B1	<i>North Area Proposed Bond Map Mined Areas</i>	November 8, 2013
145-B2	<i>South Area Proposed Bond Map Mined Areas</i>	November 8, 2013
145-B1	<i>North Area Proposed Bond Disturbed Areas</i>	November 8, 2013
145-B2	<i>South Area Proposed Bond Map Disturbed Areas</i>	November 8, 2013
145-B1	<i>North Area Proposed Bond Map Phase I Release Mined Areas</i>	November 8, 2013
145-B2	<i>South Area Proposed Bond Map Phase I Release Mined Areas</i>	November 8, 2013
145-B1	<i>North Area Proposed Bond Map Phase I Release Areas</i>	November 8, 2013
145-B2	<i>South Area Proposed Bond Map Phase I Release Areas</i>	November 8, 2013
145-B1	<i>North Area Proposed Bond Map Phase I Release Disturbed Areas</i>	November 8, 2013
145-B2	<i>South Area Proposed Bond Map Phase I Release Disturbed Areas</i>	November 8, 2013
145-B1	<i>North Area Proposed Bond Map Phase II Release Areas</i>	November 8, 2013
145-B2	<i>South Area Proposed Bond Map Phase II Release Areas</i>	November 8, 2013
145-B1	<i>North Area Proposed Bond Map Phase II Release Mined Areas</i>	January 3, 2014
145-B2	<i>South Area Proposed Bond Map Phase II Release Mined Areas</i>	January 3, 2014
145-B1	<i>North Area Proposed Bond Map Phase II Release Disturbed Areas</i>	November 8, 2013
145-B2	<i>South Area Proposed Bond Map Phase II Release Disturbed Areas</i>	November 8, 2013

2. The revised bond maps account for the most recently approved releases of reclamation liability (approved by Order dated December 4, 2012, September 10, 2013, and January 21, 2014) as well as the removal of undisturbed areas and changes to correct minor mapping errors on previous bond maps.
3. The revised bond maps show a total of 1,139 acres bonded at the full mined rate and 647 acres bonded at the full disturbed rate. In addition, the revised bond maps depict a total of 6,973 acres of land with Phase I release of reclamation liability and 872 acres of land with Phase I and II release of reclamation liability. These areas are shown on Drawing Nos. 145-B1 and 145-B2. Alcoa's revised reclamation cost estimate is \$26,256,023. Alcoa does not request a reduction of the approved self-bond instrument in the amount of \$56,000,000, in this application. Staff notes that a replacement self-bond in the amount of \$28,000,000, submitted by letter dated November 15, 2013, has been filed with the Hearings Division (Docket No. C14-0010-SC-01-E).

**PROPOSAL EVALUATION**

1. The proposed bond map revision, including bond category changes and the removal of undisturbed areas from the bond, was reviewed as revision to the approved permit
2. The bond change maps, Drawing Nos. 145-B5 and 145-B6, included in the January 8<sup>th</sup> supplement show the proposed bond category change areas. The minor mapping errors corrected in Revision No. 40 account for a total of 2.5 acres. Other changes include approximately 571.2 acres of undisturbed area that have been removed from the bonded area, 4,178.04 acres that have recently received Phase I release of reclamation liability (by Order dated September 10, 2013), and 303.22 acres that have received Phase III release of reclamation liability (by Orders dated December 4, 2012, and January 21, 2014, respectively). Cade Harris of SMRD's Inspection and Enforcement Staff verified in a February 10, 2014, e-mail that the proposed bond reduction areas shown on the bond change maps correctly reflect actual disturbance. The following table summarizes these changes:

<b>Category Change</b>	<b>Proposed Acreage</b>
<b>Mapping Error Correction:</b>	
Undisturbed to Phase I (disturbed)	0.57 acres
Mined to Disturbed	1.14 acres
Mined to Phase I (disturbed)	0.43 acres
Undisturbed to Phase I (mined)	0.36 acres
<b>Total</b>	<b>2.5 acres</b>
<b>Removal of Undisturbed Area:</b>	
Phase I (disturbed) to Undisturbed *	5.75 acres
Disturbed to Undisturbed	542.86 acres
Mined to Undisturbed (include 6.74 acre cemeteries)	22.61 acres
<b>Total</b>	<b>571.22 acres</b>
<b>Recent Bond Releases:</b>	
Mined to Phase I	3,212.02 acres
Disturbed to Phase I	966.02 acres
<b>Total</b>	<b>4,178.04 acres</b>
Mined to Phase I,II,III	120.04 acres
Phase II to Phase III	183.18 acres
<b>Total</b>	<b>303.22 acres</b>

\* Incorrectly represented as having Phase I release on the approved bond map (Revision No. 31), but now corrected to match the Commission Order for Docket No. C12-0028-SC-01-F.

3. The bond release areas shown on Drawing Nos. 145-B1 and 145-B2 are accurate and correspond with Commission Orders approving release of reclamation liability.
4. Staff's approved cost estimate was calculated during review of Revision No. 31 (approved administratively by letter dated July 24, 2012). The Staff reclamation cost analysis in Revision No. 17 (dated August 22, 2011) is revised to reflect updated equipment productivities and costs. The unit

reclamation costs were taken from the attached revised Staff reclamation cost analysis. A summary of estimated reclamation costs for Revision No. 40 is provided as follows:

<b>SUMMARY OF ESTIMATED RECLAMATION COSTS</b>			
Disturbance Category <sup>1</sup>	Cost per Acre	Acres <sup>2</sup>	Estimated Cost
Mined Rate	\$5,526	1,139.0	\$6,294,114
Mined Phase I (60%) Reduction	\$2,210	5,705.0	\$12,608,050
Mined Phase II Reduction	\$1,048	861.0	\$902,328
Disturbed Rate	\$4,169	647.0	\$2,697,343
Disturbed Phase I (60%) Reduction	\$1,668	1,268.0	\$2,115,024
Disturbed Phase II Reduction	\$1,048	11.0	\$11,528
	SUBTOTAL		\$24,628,387
	ADMINISTRATIVE COST (10%)		\$2,462,839
<b>TOTAL RECOMMENDED RECLAMATION BOND</b>			<b>\$27,091,226</b>

<sup>1</sup> Mined Areas: Includes any area where spoil is deposited, the active pit, and any highwall reduction areas.

Disturbed Areas: Includes reclamation activities (such as clearing and grubbing, topsoil removal, etc.) associated with construction of sediment ponds, diversions, access roads, haul roads, and facilities where the area is not mined.

Ancillary Areas: Includes disturbance areas on which soil preparation and seeding are the only required reclamation activity.

<sup>2</sup> All acreage figures were taken from the revised bond maps, Drawing No. 145-B1, *North Area Proposed Bond Map*, and Drawing No. 145-B2, *South Area Proposed Bond Map*, dated revised January 3, 2014.

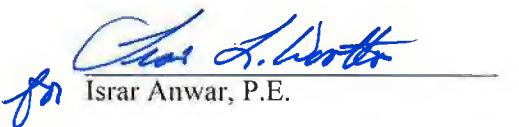
5. Staff's previous reclamation cost estimate of \$43,669,725, was included with Revision No. 31. The decreased reclamation cost estimate reflected in this memorandum is primarily due to credit for recently approved release of reclamation liability areas and the removal of previously bonded areas that were not disturbed by mining activities. The increased per-acre unit costs in Staff's revised reclamation cost analysis are due to higher equipment and fertilizer costs.
6. Alcoa has provided the information necessary to determine compliance with §§12.226, 12.142(2)(C), 12.145(b)(2), 12.304, and 12.307.

**CONCLUSIONS AND RECOMMENDATIONS**

The request for approval of the revised bond maps and reclamation cost estimate are a revision to Permit No. 1F. Staff's reclamation cost estimate shows that \$27,091,226 is necessary for reclamation of the mine in the event of forfeiture. Staff's estimate in the amount of \$27,091,226 is higher than Alcoa's estimate of \$26,256,023 and is recommended for adoption as the minimum required reclamation bond amount.

Alcoa's \$56,000,000 self-bond approved by Order dated February 7, 2012, is sufficient to cover the cost of reclamation. The revisions to the approved permit do not appear to constitute a significant departure from the method of conduct of reclamation operations contemplated in Permit No. 1F, in accordance with §12.226. Alcoa has provided the information necessary in Revision No. 40 to demonstrate compliance with §§12.226, 12.142(2)(C), 12.145(b)(2), 12.304, and 12.307. Based on my technical review, we recommend approval of Revision No. 40, including revised bond maps, Drawing No. 145-B1, *North Area Proposed Bond Map*, and Drawing No. 145-B2, *South Area Proposed Bond Map*, dated revised January 3, 2014.

Should the \$28,000,000 replacement self-bond currently under review be accepted by the Commission, it will be sufficient to cover the cost of reclamation in the event of forfeiture by Alcoa.

  
Israr Anwar, P.E.

**STAFF RECLAMATION COST ANALYSIS**



**RAILROAD COMMISSION OF TEXAS**

BARRY T. SMITHERMAN, Chairman  
DAVID PORTER, Commissioner  
CHRISTI CRADDICK, Commissioner

**SURFACE MINING AND RECLAMATION DIVISION**

JOHN E. CAUDLE, P.E.  
Director

**ALCOA INC.  
SANDOW MINE, PERMIT NO. 1F  
REVISION NO. 40  
STAFF RECLAMATION COST ANALYSIS**

February 13, 2014

**STAFF RECLAMATION COST ANALYSIS**  
**ALCOA INC.**  
**SANDOW MINE**

This report is prepared to provide the basis by which the Railroad Commission will determine a performance bond amount in accordance with §§12.304 and 12.307 for the Sandow Mine. Section 12.301 of the "Surface Coal Mining Regulations" (Regulations) requires the filing of a performance bond with the Commission after an application for a permit to conduct surface coal mining and reclamation operations has been approved, but before such a permit is issued. Section 12.304 requires that the bond amount shall be the estimated cost to the Commission if it had to perform the reclamation and abatement work under the Regulations and any permit(s) issued by the Commission. Section 12.307(c) of the Regulations allows the revision of the amount of performance bonds when the cost of future reclamation work changes.

The equipment costs used in this estimate are from the "Cost Reference Guide for Construction Equipment," an annual publication produced by Dataquest, Inc. Costs are updated annually. Equipment selection and productivity were calculated using the "Caterpillar Performance Handbook." Equipment productivities are based on the information contained in Edition 40 and 42, as indicated footnotes on Appendices A through E. Equipment costs used in the Staff's reclamation cost estimate are listed in Table VI of the report.

Mining at the Sandow Mine has ceased and only reclamation activities are in progress. The reclamation costs for the Sandow Mine have been classified into the following five work categories: Overburden spoil leveling, disturbed area leveling, soil preparation, revegetation and maintenance. The cost associated with each of these five categories is summarized in Table II. Mining operations have been segregated into two general disturbance categories:

- (1) Mined Acreage: Includes any area where spoil is deposited, the active pit and any highwall reduction areas.
- (2) Disturbed Acreage: Includes activities (such as clearing and grubbing, topsoil removal, etc.) associated with construction of sedimentation ponds, diversions, access roads, haul roads and facilities where the area is not mined.
- (3) Ancillary Acreage: Includes disturbance areas on which soil preparation and seeding are the only required reclamation activities.

The reclamation costs for the disturbance categories are determined by the selection and summation of costs in each appropriate work activity required for reclamation of the mining disturbance. The summation of work activities to determine the cost to reclaim for various disturbance categories is provided in Tables III, IV and V. Mathematical rounding to one decimal place was made after each step of computation.

### Overburden Spoil Leveling

The mine plan calls for the use of draglines as the primary overburden removal equipment. Based on the information presented in the permit, the average crest-to-crest distance of spoil banks was 120 feet with an angle of repose of 36 degrees. The theoretical quantity of spoil material to be moved per acre in the leveling operation can be computed using the following equation:

$$V_m = 100.83 B (\tan A), \text{ where:}$$

$V_m$  = total volume of spoil moved per surface acre,

$B$  = crest-to-crest distance of spoil banks, and

$A$  = angle of repose of spoil bank

Substituting the above-information into the equation, the quantity of spoil to be moved on a per-acre basis is about 8,791 loose cubic yards (lcy). The quantity of the spoil per acre to be moved is multiplied by 1.33 to account for a 33% rehandle of the spoil by the bulldozers; therefore, the volume of spoil is estimated to be 11,692 loose cubic yards.

Equipment typically used to level overburden spoil piles and disturbed areas are as follows:

1. Bulldozer (U-Blade)	Cat D9T
2. Scraper	Cat 631G
3. Motor Grader	Cat 14M

Through the use of information obtained from the *Caterpillar Performance Handbook* it was determined that a D-9T dozer can move and level 557 loose cubic yards of spoil per hour (Appendix A) for 250 feet of push distance. Assuming this leveling rate, the number of dozer hours required to level one acre of overburden spoil is approximately:

$$\text{D-9T Dozer Hours} = \frac{11,692 \text{ lcy/ac}}{557 \text{ lcy/hr}} = 21 \text{ hrs/ac}$$

A motor grader will be required to final grade the leveled overburden. The motor grader will make two passes over the leveled spoil at a production rate of 0.3 hours per acre (Appendix D). A motor grader with a ripper bar (ripping to a depth of 1.3 feet) will be utilized to pre-condition the overburden prior to soil preparation and revegetation. It will be necessary for the motor grader with ripper to make one pass over the leveled and graded spoil with a production rate of 0.6 hours per acre (Appendix E). The number of hours required for grading and ripping will be approximately:

$$14M \text{ Motor Grader Hours} = 0.3 \text{ hr/ac} \times 2 \text{ passes} = 0.6 \text{ hrs}$$

$$14M \text{ Motor Grader w/ Ripper Hours} = 0.6 \text{ hr/ac} \times 1 \text{ pass} = 0.6 \text{ hrs}$$

### Disturbed Area Leveling

All land disturbed in support of mining operations will require reclamation. These disturbed areas include sedimentation ponds, diversions, and roads. Based on Staff computations and information provided in the reclamation cost estimate in the approved permit, it is estimated that approximately 2,000 bank cubic yards of material per acre will be required to reclaim these areas. This amount of material has been compacted; therefore, the amount of compacted material considered for productivity calculations has been multiplied by a factor of 1.2 to provide the approximate volume as measured in loose cubic yards (2,000 bcy x 1.2 = 2,400 lcy).

Scraper productivity is calculated at 280 lcy per hour (Appendix B) for 1,000-foot haul distance. After spoil placement with scrapers, a dozer will be required for leveling. The calculated productivity of a D-9T dozer for leveling is approximately 0.5 hours per acre (Appendix C). A dozer will also be required to assist in loading the scrapers at the rate of 1 dozer hour for each 3 scraper hours. An 8,000 gallon water tanker will be used to suppress dust generated by the scrapers at the rate of 1 tanker hour for each 6 scraper hours.

$$631\text{G Scraper Hours} = \frac{2,400 \text{ lcy/ac}}{280 \text{ lcy/hr}} = 8.6 \text{ hr/ac}$$

$$\text{D-9T Dozer Hours} = 0.5 \text{ hrs/ac} + \frac{8.6}{3} = 3.4 \text{ hr/ac}$$

$$8,000 \text{ Gallon Water Truck Hours} = \frac{8.6}{6} = 1.4 \text{ hr/ac}$$

A motor grader will make two passes at a production rate of 0.3 hours per acre (Appendix D). A motor grader with a ripper bar (ripping to a depth of 1.3 feet) will be utilized to pre-condition the disturbed areas prior to soil preparation and revegetation. It will be necessary for the motor grader to make one pass over the disturbed areas with a production rate of 0.8 hours per acre (Appendix E). The number of hours required for grading and ripping will be approximately:

$$14\text{M Motor Grader Hours} = 0.3 \text{ hr/ac} \times 2 \text{ passes} = 0.6 \text{ hr/ac}$$

$$14\text{M Motor Grader w/ Ripper Hours} = 0.6 \text{ hr/ac} \times 1 \text{ pass} = 0.6 \text{ hr/ac}$$

### **Soil Preparation and Revegetation Costs**

The machinery used for revegetation for the purposes of this report will be conventional agricultural equipment. The equipment and associated operating cost (machine and operation), which will be used to compute reclamation costs, are listed in Table VI.

The permit contains a list of species for revegetation. The postmining land uses contained in pending Revision No. 42 and their percent areal distributions are pastureland (76.5%), fish and wildlife (3.9%), and developed water resources (8.5%) and industrial/commercial(11.1%). About 12.5% of the grassed areas are assumed to be planted in woody species. The vegetation, fertilization, and lime costs used in this analysis are located in Table VI.

The fertilizer and lime rates that will be used in the absence of soil test are as follows:

1. Initial application to all areas	288 lbs/ac of 18-18-18;
2. Application to sprigged areas after establishment	130 lbs/ac of 46-0-0; and
3. Annual applications to sprigged areas	288 lbs/ac of 18-18-18
4. One-time application to areas planted w/woody species during the maintenance period.	79 lbs/ac of 18-18-18
5. Lime, one-time application to all areas	5 tons/ac

For purposes of estimating revegetation costs, it will be assumed that the entire acreage will receive the same soil preparation prior to sprigging or seeding. Species will be machine and/or hand planted. A one-time lime application of 5 tons/acre will be added during the initial soil preparation.

The temporary cover crop (e.g., wheat) will be planted on approximately 50% of the area to be revegetated to prevent excessive erosion prior to establishing a permanent cover. Bluestem grass (var. Gordo) will be planted in 10% of the grass area for wildlife habitat. Bluestem grass seed will be planted with the planting of wheat. Another annual cover crop (e.g., brown top millet) will be planted to prevent excessive erosion during the spring and summer months in areas to be planted to trees. Clover will be broadcast in pastureland areas after the second mowing in the fall. Areas with temporary revegetation will be planted to permanent vegetation at the next available opportunity according to the season. Since weather conditions at certain times of the year are not conducive to planting and establishment of a temporary cover crop, it is further assumed that 50% of the revegetated area will receive a hay mulch treatment at a rate of two tons per acre, anchored with a mulch crimper.

It is estimated that as much as 20% of the acreage may need to be replanted. The initial planting plus this additional 20% planting is represented in the attached table by the planting factor of 1.2. The additional planting will be done the second year after initial revegetation. Chemical weed control will be practiced on three occasions over the entire revegetated area during the five-year period. Areas planted to trees will be fertilized once during the maintenance period. Areas planted to coastal bermudagrass will be fertilized and mowed twice in the year of establishment and once yearly during the remaining four year period.

The permittee is required to maintain the revegetated areas for a total of five years after the vegetative cover performance standards have been achieved. Soil tests (20-acre grids) will be conducted to determine fertilization needs and AFM/TFM in compliance with the Regulations. This information will be provided to the Commission prior to accepting lands into the extended responsibility period. Additionally, the results of the soil analyses (20-acre grids) to determine fertility needs for the last three years of the ERP will also be provided to the Commission.

TABLE II  
SUMMARY OF RECLAMATION COSTS

WORK CATEGORY	EQUIPMENT	UNITS	COST/UNIT	COST PER ACRE (\$/ac)
<b>OVERBURDEN SPOIL LEVELING</b>				
D-9T with U-Blade		21.0 hrs/ac	\$207 /hr	\$4,347
14M Motor Grader		0.6 hrs/ac	\$106 /hr	\$64
14M Motor Grader w/ Ripper		0.6 hrs/ac	\$112 /hr	\$67
			<b>SUBTOTAL</b>	<b>\$4,478</b>
<b>DISTURBED AREA LEVELING</b>				
631G Scraper		8.6 hrs/ac	\$238 /hr	\$2,047
D-9T with u-Blade		3.4 hrs/ac	\$207 /hr	\$704
8,000 gal. Water Truck		1.4 hrs/ac	\$171 /hr	\$239
14M Motor Grader		0.6 hrs/ac	\$106 /hr	\$64
14M Motor Grader w/Ripper		0.6 hrs/ac	\$112 /hr	\$67
			<b>SUBTOTAL</b>	<b>\$3,121</b>
<b>SOIL PREPARATION</b>				
Postmine Revegetated Areas Percentage	91.5%			
Initial Fertilizer Application to all Areas (18-18-18)	288 lb/ac			
Fertilizer Cost			\$0.31 /lb	\$82
Number of Fertilizer Applications	1			
Fertilizer Application Cost			\$4 /ac/appl	\$4
One-Time Lime Application	5 tons/ac			
Lime Cost			\$23 /ton	\$105
Offset Disk to Incorporate Lime	0.5 hrs/ac			
Offset Disk Cost			\$60 /hr	\$27
Tandem Disk for Final Seedbed Preparation	0.5 hrs/ac			
Tandem Disk Cost			\$60 /hr	\$27
			<b>SUBTOTAL</b>	<b>\$245</b>
<b>REVEGETATION</b>				
<b>Temporary Cover Crop in all Areas</b>				
Percentage of Revegetated Area Planted to Temporary Cover Crop (Wheat and Bluestem)	45.8%			
Cover Crop Cost			\$14	\$6
Tractor w/ Grain Drill for Cover Crop Cost			\$18	\$8
Tractor w/ Grain Drill for Cover Crop	0.5 hrs/ac			
Tandem Disk Cost			\$60	\$14
Percentage of Area Mulched	45.8%			
Mulch and Tack Cost		\$200 /ac		\$92
<b>Permanent Crop (bermuda grass)</b>				
Percentage of Postmine Area Sprigged	87.6%			
Planting Factor	1.2			
Coastal Bermuda Crop Cost			\$24 /ac	\$25
Tractor w/ Sprigger Cost			\$36 /ac	\$38

Fertilizer Applied After Establishment to Sprigged/Grassed areas (46-0-0)	130	lb/ac		
Fertilizer Cost			\$0.28	\$32
Number of Fertilizer Application	1			
Fertilizer Application Cost			\$4 /ac/appl	\$4
Number of Mowings	2			
Mowing Cost			\$18 /lb	\$32
Clover Seed Cost			\$9 /ac	\$8
Broadcast Application of Clover Seed			\$4 /ac	\$4
<b>Permanent Crop (Trees &amp; Shrubs)</b>				
Percentage of Postmine Area to Trees and Shrubs	13.5%			
Planting Factor	1.2			
Cost of Grass Crop (Brown top millet)			\$26 /ac	\$4
Cost of Tractor w/ Grain Drill for Grass Crop			\$18 /ac	\$2
Trees and Shrubs Cost			\$85 /ac	\$14
Initial Soil Testing	Percentage of Postmine Area to be Tested	91.5%		
Test Cost (\$/20 ac grid)			\$267 /20 ac grid	\$12
			<b>SUBTOTAL</b>	<b>\$295</b>

#### MAINTENANCE 2nd thru 5th years

All Areas				
Postmine Revegetated Area Percentage	91.4%			
10% Soil Testing (\$/ac)			\$1.25 /ac	\$1
Soil Testing (\$/ac)			\$2.7 /ac	\$2
Number of Weed Control Applications	3			
Chemical Weed Control Cost			\$10 /ac	\$27
<b>Permanent Crop (bermuda grass)</b>				
Percentage of Postmine Area Sprigged	87.6%			
Annual Fertilizer Application (288 lb of 18-18-18)	288	lbs/ac		
Number of Years of Maintenance	4			
Fertilizer Cost			\$0.31 /lb	\$313
Number of Fertilizer Applications	4			
Fertilizer Application Cost			\$4 /ac/appl	\$14
Number of Mowings	4			
Mowing Cost			\$18 /ac	\$63
Amount of grass to be baled	4	tons/ac		
Baling Cost			\$24 /ac	\$84

Percentage of Postmine Area to Trees and Shrubs	13.5%			
Annual Fertilizer Application to Wooded Areas	79	lbs/ac		
Fertilizer Cost			\$0.31 /lb	\$3
Number of Fertilizer Applications	1			
Fertilizer Application Cost			\$4 /ac/appl	\$1
			<b>SUBTOTAL</b>	<b>\$508</b>

**TABLE III**  
**MINED RATE DISTURBANCE**  
**ESTIMATED RECLAMATION COSTS**

<b>WORK CATEGORY</b>	<b>COST PER ACRE (\$/ac)</b>
Overburden Spoil Leveling	\$4,478
Soil Preparation	\$245
Revegetation	\$295
Maintenance	\$508
<b>TOTAL</b>	<b>\$5,526</b>

**TABLE IV**  
**DISTURBED RATE DISTURBANCE**  
**ESTIMATED RECLAMATION COSTS**

<b>WORK CATEGORY</b>	<b>COST PER ACRE (\$/ac)</b>
Disturbed Area Leveling	\$3,121
Soil Preparation	\$245
Revegetation	\$295
Maintenance	\$508
<b>TOTAL</b>	<b>\$4,169</b>

**TABLE V**  
**ANCILLARY RATE DISTURBANCE**  
**ESTIMATED RECLAMATION COSTS**

<b>WORK CATEGORY</b>	<b>COST PER ACRE (\$/ac)</b>
Soil Preparation	\$245
Revegetation	\$295
Maintenance	\$508
<b>TOTAL</b>	<b>\$1,048</b>

**TABLE VI**  
**EQUIPMENT AND MATERIALS COSTS**

<b>Equipment or Material</b>	<b>Cost</b>
Catepillar D-9T Dozer	\$207/hr
Catepillar 631G Scaper	\$238/hr
Catepillar 14M Grader	\$106/hr
Catepillar 14H Grader with ripper	\$112/hr
8,000 Gallon Water Truck	\$171/hr
Agricultural Tactor w/ Offset Disk (0.5 hrs/ac)	\$60/hr
Agricultural Tactor w/ Tandem Disk (0.5 hrs/ac)	\$60/hr
Agricultural Tactor w/ Spriger	\$36/ac
Agricultural Tactor w/ Grain Drill	\$18/ac
Mulching and Tacking	\$200/ac
Baling	\$24/ton
Mowing	\$18/ac
Broadcast Application of Clover Seed	\$4/ac
Chemical Weed Control	\$10/ac
Initial Soil Test	\$267/20 ac grid
Soil Test - Last Three Years of Liability Period	\$54/20 ac grid
Soil Test - Fourth year of liability period - 10% of area	\$25/20 ac grid
Planting Trees and Shrubs (including labor)	\$85/ac
Coastal Bermuda Grass sprigs	\$24/ac
Mixture of Native Grasses	\$65/ac
Clover Seed Cost	\$9/ac
Temporary Cover Crop (cool season - wheat)	\$14/ac
Temporary Cover Crop (warm season - millet)	\$26/ac
Fertilizer (18-18-18)	\$620/ton = \$0.31/lb
Fertilizer (46-0-0)	\$554/ton = \$0.28/lb
Fertilizer Application Costs	\$4/ac
Agricultural Lime (applied)	\$23/ton
Sorghum Seed Cost	\$13/ac
Harvesting Cost	\$40/ac

**APPENDICES  
SANDOW MINE  
REVISION NO. 40  
STAFF RECLAMATION COST ANALYSIS  
EQUIPMENT PRODUCTIVITIES**

**APPENDIX A**  
**SANDOW MINE**  
**STAFF RECLAMATION COST ANALYSIS**

**PRODUCTIVITY FOR DOZER USE**

Activity                           Rough leveling of spoil material  
 Characterization of Equipment Used: Caterpillar D9T (w/U blade)  
 Description of Dozer Route: -10% grade

Productivity Calculations

Operator Factor	0.8
Material Factor	1.1
Job Efficiency Factor	0.83 (50 min/hr)
Grade Factor	1.2
Weather Factor	1.1
Slot Dozing Factor	1.2
Productivity Adj. Factor =	(Oper. Factor x Mat. Factor x Job Eff. Factor x Gr. Factor x Slot Doz Factor) / Weather Factor
Productivity Adj. Factor =	0.96
Adjusted Dozer Productivity =	Productivity Adj. Factor x Optimum Dozer Productivity

Ave. Push Distance (ft)	Optimum Dozer Productivity (lcy/hr)	Adjusted Dozer Productivity (lcy/hr)
250	580	557

**APPENDIX B**  
**STAFF RECLAMATION COST ANALYSIS**  
**PRODUCTIVITY FOR SCRAPER USE**

Characterization of Equipment Used: Caterpillar 631G Scraper

Scraper Capacity	29 lcy (average)
Average Grade	0%
Rolling Resistance	10%
Total Resistance	10%
Job Efficiency Factor	0.83 (50 min/hr)
Weather Factor	1.1
Operator Factor	0.8
Load Time	0.6 min
Maneuver and Dump Time	0.7 min

Adjusted Hourly Productivity = Scraper Capacity x Job Effic. Factor x Oper. Factor x 60 min/hr  
/ (Total cycle Time x Weather Factor)

Haul Distance (ft)	Loaded Trip Time	Return Trip Time	Total Cycle Time	Adjusted Scraper Productivity (lcy/hr)
1,000	1.50	0.95	3.75	280

Characterization of Push Dozer: Caterpillar D-9T w/U Blade

**Assume one dozer hour for each 3 scraper hours**

Characterization of Water Truck: 8,000 Gallon Capacity Off-Highway Water Truck

**Assume one water truck hour for each 6 scraper hours**

**APPENDIX C**  
**SANDOW MINE**  
**STAFF RECLAMATION COST ANALYSIS**

**PRODUCTIVITY FOR DOZER USE**

Activity	Reclamation of ponds, roads, and diversions	
Characterization of Dozer	Caterpillar D-9T w/U blade	
Forward Speed	2.4	mph
Reverse Speed	5.2	mph
Blade Width	15	feet
Description of Route	one pass over area	
Productivity Factor:		
Operator Efficiency	0.8	
Work Hour (50 min/hr)	0.83	hr
10% Bad Weather Allowance	1.1	
Productivity Calculations:		
Hourly Production (forward)	43560/(Blade Width x 5280x Forward Speed)	
	0.2	hr/ac
Hourly Production (reverse)	43560/(Blade Width x 5280x Reverse Speed)	
	0.1	
Total Hourly Production	0.3	hr/ac
Adjusted Hourly Production	Total Hourly Production x Weather Allowance / (Work Hour x Op. Eff.)	
	0.5	hr/ac

## **APPENDIX D**

### **SANDOW MINE**

### **STAFF RECLAMATION COST ANALYSIS**

## PRODUCTIVITY FOR GRADER

Activity Final Grading Mined and Disturbed Areas  
Characterization of Equipment Used: Caterpillar 14M Grader

<u>Productivity Calculations</u>		
Effective blade width	12	ft
Forward speed	3.3	mph
Operator Factor	80%	
Job Efficiency Factor	0.83	(50 min/hr)
Weather Factor	1.1	

Adj. Grader Prod. = (Weather Factor x sf/ac)/(Job Eff. Factor x Op. Factor x Blade Width x Feet/mile x Speed)

Weather Factor	Sq. Ft. per acre	Job Efficiency Factor	Operator Factor	Blade Width (ft)	Feet per Mile	Average Speed (mph)	Adjusted Dozer Productivity (hr/ac)
1.1	43,560	0.83	80%	12	5,280	3.3	0.3

**APPENDIX E**  
**SANDOW MINE**  
**STAFF RECLAMATION COST ANALYSIS**

**PRODUCTIVITY FOR GRADER WITH RIPPER**

Activity: Pre-condition Overburden for Soil Preparation and Vegetation

Characterization of Equipment Used: Caterpillar 14M Grader w/ripper

Productivity Calculations

Ripping Depth	1.3 ft
Width per pass	8.5 ft
Average Speed	2.7 mph
Operator Factor	80%
Job Efficiency Factor	0.83 (50 min/hr)
Weather Factor	1.1

Assume 1 pass over all areas prior to topsoiling or soil preparation.

Adj. Grader Prod. = (Weather Factor x sf/ac)/(Job Eff. Factor x Op. Factor x Blade Width x Feet/mile x Speed)

Weather Factor	Sq. Ft. per acre	Job Efficiency Factor	Operator Factor	Blade Width (ft)	Feet per Mile	Average Speed (mph)	Adjusted Dozer Productivity (hr/ac)
1.1	43,560	0.83	80%	8.5	5,280	2.7	0.6

Israr Anwar

Permit No. 1F

PROJECT ID 1325502

---

**From:** Cade Harris  
**Sent:** Monday, February 10, 2014 2:21 PM  
**To:** Israr Anwar  
**Subject:** Sandow Rev. 40

Anwar,

After inspecting the areas associated with Revision 40, I confirmed through visual inspection and soil profile examination that these bond rate changes are consistent with designations contained in Revision 40. Please let me know if you have any further questions.

Thanks

**Cade Harris**

Natural Resource Specialist II  
Railroad Commission of Texas  
Surface Mining and Reclamation Division  
Office: (512) 305-8832  
Cell: (512) 281-6023



**Alcoa Primary Metals**  
Energy Division-Sandow Mine  
3990 John D. Harper Road  
PO Box 1491  
Rockdale, TX 76567-1491 USA

January 8, 2014

Mr. John E. Caudle, Director  
Surface Mining and Reclamation Division  
Railroad Commission of Texas  
P.O. Box 12967  
Austin, Texas 78711-2967

**RE: Alcoa Sandow Mine, Permit No. 1F**  
**Revision No. 40**  
**Bond Map Revision**  
**Response to Comments Dated November 6, 2013**  
**File Reference No. 1325502**  
**Alcoa Submittal 2014-03**

Dear Mr. Caudle:

Alcoa received your letter dated November 6, 2013 regarding proposed Revision 40 which updates the approved bond maps for the Sandow Mine. Enclosed, please find our responses to your comments along with the revised maps and a CD containing electronic versions of the proposed maps in both AutoCAD and GIS formats.

Please do not hesitate to call me if you have questions concerning this submittal.

Respectfully,

A handwritten signature in black ink that appears to read "Tommy E. Hodges".

Tommy E. Hodges, P.E.  
Energy Manager

Railroad Commission  
of Texas  
RECEIVED  
JAN 09 2014  
Surface Mining Division

**Alcoa Inc.**  
**Sandow Mine, Permit No. 1F**  
**Revision 40**  
**Proposed Bond Map Revisions**  
**Response to Staff Comments, November 5, 2013**

1. Revision 40 includes revised bond maps (Dwg. Nos. 145-B1, *North Area Proposed Bond Map*, and 145-B2, *South Area Proposed Bond Map*) and bond change maps (Dwgs Nos. 145-B5, *North area Proposed Bond Map Changes*, and 145-B6, *South Area Proposed Bond Map Changes*). The map legends of Dwg. Nos. 145-B1 and B2 indicate they are both dated August 19, 2013, but the revision block of the maps indicate revisions dated earlier. The map legends of DWG. Nos. 145-B5 and B6 indicate they are both dated September 9, 2013, but the revision block of the maps indicate revisions dated earlier. These discrepancies must be addressed.

**Response:**

**Alcoa maintained the revision blocks from previous versions of the bond maps as a method of tracking revisions to the bond maps that were made over time. Alcoa has removed all previous dates and now provides maps with only the current dates to avoid confusion. New versions of the maps are provided with this response**

2. Staff used the digital bond maps files provided in this application to verify Phase I bond release areas shown on the bond maps. The digital files match the bond maps (Dwg. Nos. 145-B1 and 145-B2) but calculated that they show a total of 5,853.9 acres bonded at the mined rate which are released from Phase I bond reclamation liability. Alcoa's reclamation cost summary indicates this acreage to be 5,704.5 acres. Additionally, the bond maps depict a total of 1,356 acres (verified using the provided digital files) to be bonded at the disturbed rate that have been released from Phase I bond reclamation liability. Alcoa's reclamation cost summary indicates this acreage to be 1,267.8 acres.

**Response:**

**Alcoa has verified the acres included in the reclamation cost summary for the mined and disturbed bond rates for which Phase I release has been granted and determined that the numbers contained in the summary are correct. To aid RCT staff in their review of this request, Alcoa has created a series of four maps, each of which contains only the mined rate, Phase I release areas and the disturbed rate, Phase I release area. These maps are provided to allow RCT to determine acreages in each category and to prevent any confusion between bond categories.**

3. The bond maps (DWG. Nos. 145-B1, *North Area Proposed Bond Map*, and 145-B2, *South Area Proposed Bond Map*), show 683.2 acres bonded at the disturbed rate. Alcoa's Reclamation cost summary accounts for 643.7 acres at the disturbed rate.

**Response:**

Alcoa has verified that the acres included in the reclamation cost estimate for lands bonded at the disturbed rate provided in the submittal were correct and agreed with the maps provided. Alcoa has created a series of two maps, one for the north area and one for the south that only includes those areas that are proposed to be bonded at the disturbed rate to aid the RCT in their review. In addition, as a result of the inspection conducted on the proposed bond map revisions, Alcoa has determined that a small portion of the Pond 020 stockpile area was inadvertently omitted from the maps. Alcoa has added this area back into the maps and updated the estimated bond calculations accordingly.

4. The bond change maps (Dwg. Nos. 145-B5, *North Area Proposed Bond Map Changes*, and 145-B6, *South Area Proposed Bond Map Changes*), show 55.25 acres bonded at the disturbed rate being removed from bond because the land was not disturbed. This contradicts with Table 1, *Comparison of Proposed Bonding to Approved Bonding*, which shows 545.73 acres of undisturbed area is being removed from the area bonded at the disturbed rate.

**Response:**

Alcoa has verified the acreages provided in Table 1, *Comparison of Proposed Bonding to Approved Bonding* to the areas included on the maps as changing from disturbed rate to undisturbed and determined that the acreages in the table agree with those shown on the map. It should be noted that the total acreage changing from disturbed rate category to undisturbed consists of 551.48 acres, which is comprised of 545.73 acres currently bonded at the disturbed rate and 5.75 acres currently bonded at the disturbed rate with Phase I release approved. Alcoa provides a map for the North and South Sandow Area that only shows the areas proposed to be modified from the disturbed rate categories to undisturbed.

5. Table 1 shows 0.57 and 0.35 acres that are currently bonded at the disturbed rate are proposed for Phase I bond release due to mapping error. Alcoa must explain how this error has occurred. Land cannot be released from bond unless approved by the Commissioners.

**Response:**

The acreages shown in the table proposed to move from disturbed rate to Phase I bond release rate resulted from mapping errors in which slivers along the edges of the approved Phase I bond release areas were not updated in the approved map. The Phase I bond release area included these sliver areas, which were inspected during the bond release process and managed along with the adjacent areas throughout the management period. These errors are simply correcting mapping errors from previously approved bond maps.

6. The disturbance boundary proposed in this application will require revision to the approved postmine land use maps, and postmine slope and topography maps.

**Response:**

Alcoa will provide the RCT with modified postmine land use maps and postmine slope and topography maps upon RCT approval of these pending bond map revisions.

7. Field verification of the proposed changes to bond maps is in progress and has not yet completed. It appears from the preliminary investigation that not all mining-related disturbance is included within the proposed disturbance boundary.

**Response:**

Alcoa has updated the proposed bond maps and tables to include the Pond 020 Stockpile area noted by Inspection and Enforcement staff during the site inspection of the proposed bond map revisions.

No other areas were noted during the inspection that consisted of mining-related disturbance. One area noted during the inspection consisted of an overhead powerline that was shredded and brush removed as part of normal electrical maintenance activities. This powerline is utilized for the industrial/commercial operation of the Sandow Units 4 and 5 and not for mining purposes. An area noted in the I-South area consists of disturbance related to wildlife management activities and is also not mining related.

**Errata:**

Although no issues were noted by RCT on the remaining bond map categories, Alcoa also provides with this supplement a series of maps, divided into the north and south Sandow units for each of the following bonding categories: Mined, Mined Phase I and II Release, Disturbed Phase I and II Release. These maps complete the set of individual category maps provided as part of Alcoa's responses to Comments 2, 3 and 4. Additionally, since Alcoa's initial filing, the proposed Phase III release of the area known as the Crab Claw has been approved and is scheduled to go before the Commissioners for final approval on January 21. Alcoa has revised the maps to include this area as fully released from bond.

**Table 1 – Comparison of Proposed Bonding to Approved Bonding**

BOND RATE REV 40	BOND RATE REV 31	ACRES
DIST	DIST	645.44
PHASE1_DIST	DIST	966.02
PHASE1_DIST	PHASE1_DIST	300.85
PHASE1_DIST	UN_DIST	0.57
DIST	MINED	1.14
PHASE1_DIST	MINED	0.43
PHASE12_DIST	PHASE12_DIST	11.17
PHASE123_DIST	PHASE123_DIST	7.78
	DIST	<b>1933.4</b>
MINED	MINED	1138.31
PHASE1_MINED	MINED	3212.02
PHASE1_MINED	PHASE1_MINED	2492.27
PHASE1_MINED	UN_DIST	0.36
PHASE12_MINED	PHASE12_MINED	860.68
PHASE123_MINED	MINED	120.04
PHASE123_MINED	PHASE12_MINED	183.18
PHASE123_MINED	PHASE123_MINED	9.95
	MINED	<b>8016.81</b>
UN_DIST	PHASE1_DIST	5.75
UN_DIST	DIST	542.86
		<b>548.61</b>
UN_DIST	MINED	15.87
CEM	MINED	6.74
		<b>22.61</b>
Total bonded Acres		9629.26

	Areas with no change proposed
	Areas with mapping error revisions
	Areas currently bonded but undisturbed
	Areas with recent bond release approvals

### Sandow Mine Revision 40 Estimated Bond Calculation

WORK CATEGORY	COST PER ACRE (\$/ac)	Bonded Acres	Total Cost	Bonded Acres	Total Cost	Bonded Acres	Total Cost
		Mined Acres	Phase I	Rate	Phase II	Rate	
Overburden Spoil Leveling		1,138.31	\$6,211,758	5,704.65	\$2,183	\$12,453,251	
Soil Preparation							
Revegetation							
Maintenance							
<b>Total</b>	<b>\$5,457</b>						
WORK CATEGORY							
Disturbed Area Leveling							Phase II Rate Factor
Soil Preparation							0.2
Revegetation							
Maintenance							
<b>Total</b>	<b>\$3,896</b>	<b>total</b>					
WORK CATEGORY							
Soil Preparation							
Revegetation							
Maintenance							
<b>Total</b>	<b>\$814</b>						
Total Estimated Cost			<b>\$23,869,112</b>				
Admin Fee (10%)			\$2,386,911.17				
<b>Total Bond Estimate</b>			<b>\$26,256,023</b>				

Current Approved Bond \$56,000,000.00  
 Total Bonded Acres, All Phases 9,629

BARRY T. SMITHERMAN, CHAIRMAN  
DAVID PORTER, COMMISSIONER  
CHRISTI CRADDICK, COMMISSIONER



JOHN E. CAUDLE, P.E., DIRECTOR

# RAILROAD COMMISSION OF TEXAS

## SURFACE MINING AND RECLAMATION DIVISION

November 6, 2013

**Sent by Email and First-Class Mail**

Mr. Tommy Hodges, P.E.  
Energy Manager  
Alcoa Inc.  
P. O. Box 1491  
Rockdale, Texas 76567

RE: Sandow Mine, Permit No. 1F  
Revision No. 40  
Bond Map Revision

Dear Mr. Hodges:

Initial review of Alcoa's September 11, 2013, request for approval of Revision No. 40, which includes revised bond maps (Dwg. Nos. 145-B1, *North Area Proposed Bond Map*, and 145-B2, *South Area Proposed Bond Map*) and a reclamation cost estimate revision for Permit No. 1F is complete. A \$500 revision-application filing fee was included with this submittal. The attached comments resulted from our review of the application.

I have determined that the application is deficient, as described in the attached comments, and the 90-day review period for this application is tolled to allow Luminant an opportunity to respond to these concerns. After we receive your responses, we will have 35 days to complete our review of the application.

Field verification of the proposed changes to the bond maps is in progress. Any additional comments resulting from our inspection of the change areas will be transmitted to you as an addendum to the attached comments. Please do not respond to the attached comments until the field verification is complete. If you have any questions, please do not hesitate to call me or Mr. Israr Anwar, the Staff member responsible for coordinating review of this submittal.

Sincerely,

A handwritten signature in black ink that reads "John E. Caudle".

John E. Caudle, Director  
Surface Mining and Reclamation Division

JEC/IA/ecd  
Attachment  
File Ref. No. 1325502

**Alcoa Inc. (Alcoa)**  
**Sandow Mine, Permit No. 1F**  
**Revision No. 40**  
**Proposed Bond Map Revision**  
**Staff Comments, November 5, 2013**

1. Revision No. 40 includes revised bond maps (Dwg. Nos. 145-B1, *North Area Proposed Bond Map*, and 145-B2, *South Area Proposed Bond Map*) and bond change maps (Dwg. Nos. 145-B5, *North Area Proposed Bond Map Changes*, and 145-B6, *South Area Proposed Bond Map Changes*). The map legends of Dwg. Nos. 145-B1 and B2 indicate they are both dated August 19, 2013, but the revision block of the maps indicate revisions dated earlier. The map legends of Dwg. Nos. 145-B5 and B6 indicate they are both dated September 9, 2013, but the revision block of the maps indicate revisions dated earlier. These discrepancies must be addressed.
2. Staff used the digital bond map files provided in this application to verify Phase I bond release areas shown on the bond maps. The digital files match the bond maps (Dwg. Nos. 145-B1 and 145-B2) but calculated that they show a total of 5,853.9 acres bonded at the mined rate which are released from Phase I bond reclamation liability. Alcoa's reclamation cost summary indicates this acreage to be 5,704.5 acres. Additionally, the bond maps depict a total of 1,356 acres (verified using the provided digital files) to be bonded at the disturbed rate that have been released from Phase I bond reclamation liability. Alcoa's reclamation cost summary indicates this acreage to be 1,267.8 acres.
3. The bond maps (Dwg. Nos. 145-B1, *North Area Proposed Bond Map*, and 145-B2, *South Area Proposed Bond Map*), show 683.2 acres bonded at the disturbed rate. Alcoa's reclamation cost summary accounts for 643.7 acres at disturbed rate.
4. The bond change maps (Dwg. Nos. 145-B5, *North Area Proposed Bond Map Changes*, and 145-B6, *South Area Proposed Bond Map Changes*), show 555.25 acres bonded at the disturbed rate being removed from bond because the land was not disturbed. This contradicts with Table 1, *Comparison of Proposed Bonding to Approved Bonding*, which shows 545.73 acres of undisturbed area is being removed from the area bonded at the disturbed rate.
5. Table 1 shows 0.57 and 0.36 acres that are currently bonded at the disturbed rate are proposed for Phase I bond release due to mapping error. Alcoa must explain how this error has occurred. Land cannot be released from bond unless approved by the Commissioners.
6. The disturbance boundary proposed in this application will require revision to the approved postmine land use maps, and postmine slope and topography maps.
7. Field verification of the proposed changes to bond maps is in progress and has not yet completed. It appears from the preliminary investigation that not all mining-related disturbance is included within the proposed disturbance boundary.



September 11, 2013

3081787

SK

Alcoa Primary Metals  
Energy Division-Sandow Mine  
3990 John D. Harper Road  
PO Box 1491  
Rockdale, TX 76567-1491 USA

Mr. John E. Caudle, Director  
Surface Mining and Reclamation Division  
Railroad Commission of Texas  
P.O. Box 12967  
Austin, Texas 78711-2967

Railroad Commission  
of Texas  
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SEP 12 2013

Surface Mining Division

RE: Alcoa Sandow Mine, Permit No. 1F  
Revision 40  
Proposed Bond Map Revision  
Alcoa Submittal 2013-41

Dear Mr. Caudle:

Alcoa Inc is proposing a modification to the approved bond rate maps for the Sandow Mine, Permit 1F area. The current bond map was approved as Revision 31 by Commission letter dated October 5, 2012. Alcoa is proposing to modify the approved bond map to correct minor mapping errors, which account for a total of 2.5 acres, removal of undisturbed acreage from the bond maps that is currently bonded, comprising 574.9 acres, and updating the approved maps to reflect various phases of bond release recently approved by the Commission. A summary of the proposed changes compared to the approved bond maps is provided in Table 1 attached to this letter.

Alcoa also provides a new bond instrument calculation, which shows a new estimated bond requirement of \$26,411,086, based on the estimated bond rates included in Staff's latest technical analysis of an approved Sandow bond release application. Alcoa will submit a revised bond instrument by separate letter after Staff's review of this request. The proposed bond maps would include approximately 9,810 acres of previously mined or disturbed lands in various phases of bonding.

Provided with this letter in both hard-copy and electronic versions are Drawings 145-B1 and 145-B2, which show the proposed bond maps, Drawings 145-B3 and 145-B4, which show the bond maps approved in Revision 31, and Drawings 145-B5 and 145-B6 which show the proposed changes to the bond map. Alcoa provides with this submittal the \$500 filing fee as required by the regulations.

Please do not hesitate to call me if you have questions concerning this submittal.

Respectfully,

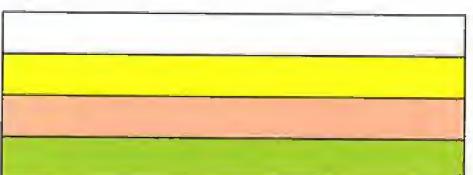
*Tommy E Hodges*

Tommy E. Hodges, P.E.  
Energy Manager

cc: John Holsinger  
Roger Nevola  
File

**Table 1 – Comparison of Proposed Bonding to Approved Bonding**

BOND RATE REV 40	BOND RATE REV 31	ACRES
DIST	DIST	642.57
PHASE1_DIST	DIST	966.02
PHASE1_DIST	PHASE1_DIST	300.85
PHASE1_DIST	UN_DIST	0.57
DIST	MINED	1.14
PHASE1_DIST	MINED	0.43
PHASE12_DIST	PHASE12_DIST	11.17
PHASE123_DIST	PHASE123_DIST	7.78
	DIST	<b>1930.53</b>
MINED	MINED	1138.31
PHASE1_MINED	MINED	3212.02
PHASE1_MINED	PHASE1_MINED	2492.27
PHASE1_MINED	UN_DIST	0.36
PHASE12_MINED	PHASE12_MINED	1043.86
PHASE123_MINED	MINED	120.04
PHASE123_MINED	PHASE123_MINED	9.95
	MINED	<b>8016.81</b>
UN_DIST	PHASE1_DIST	5.75
UN_DIST	DIST	545.73
		<b>551.48</b>
UN_DIST	MINED	15.87
CEM	MINED	6.74
		<b>22.61</b>
Total bonded Acres		9809.57



Areas with no change proposed  
 Areas with mapping error revisions  
 Areas currently bonded but undisturbed  
 Areas with recent bond release approvals

Railroad Commission  
 of Texas  
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 SEP 12 2013

Surface Mining Division

Sandow-Mine Revision '40-Estimated-Bond-Calculation